

# SEQUENCE LISTING

<110> NELSON, DAVID R.

5 <120> A LIVE, AVIRULENT STRAIN OF V. ANGUILLARUM THAT  
PROTECTS FISH AGAINST INFECTION BY VIRULENT V.  
ANGUILLARUM

<130> 5112

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<160> 4

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<170> PatentIn Ver. 2.1

<210> 1

<211> 3609

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<212> DNA

<213> V. Anguillarum

<220>

<223> "n" bases may be a, t, c, g, other or unknown

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	100	105	110
	Trp Leu Ala Asp Leu Ser Glu Lys His Trp Asp His Leu Asn Pro Val		
	115	120	125
5	Leu Pro Val Glu Thr Leu Lys Ser Asp Asp Asp Lys Gly Lys Glu Arg		
	130	135	140
10	Glu Gln Ala Asp Ala Lys Val Lys Ala Phe Phe Gln Leu Val Gly Asp		
	145	150	155
	Ser Glu Glu Ser Ser Ile Leu Tyr Ala Pro Val Leu Gln Leu Pro Leu		
		165	170
15	Val Gly Glu Val Thr Phe Phe Asp Phe Gln Ser Ala Glu Arg Lys Gly		
		180	185
	Glu Ile Ser Gln Leu Lys Ser Met Leu Thr Thr Thr Val Ala Gln Glu		
		195	200
20	Arg Phe Ala Ile Gln Phe Lys Met Glu Asn Ala Lys Arg Cys Val Thr		
		210	215
	Gln Leu Asp Arg Leu Ser Ala Leu Val Ser Thr Lys Cys His Ser Leu		
		225	230
25	Gly Ser Gln Ser Thr Asn Phe Gly Phe Ala Lys Ser Leu Leu Thr Arg		
		245	250
30	Val Glu Asn Ala Leu Val His Leu Ser Gly Ile Lys Leu Ala Pro Lys		
		260	265
	Ala Glu Ala Lys Thr Val Glu Gln Glu Val Ala Glu Ser Ser Val Ser		
		275	280
35	Glu Gly Glu Leu Pro Ser His Met Asp Thr Lys His Ile Glu Arg Ile		
		290	295
40	Pro Met Ala Ser Glu Gln Ala Gln Thr Val Ser Gln His Leu His Ala		
		305	310
	Gly Asn Leu Ser Glu Leu Gly Asn Leu Asn Asn Met Asn Arg Asp Leu		
		325	330
45	Ala Phe His Leu Leu Arg Glu Val Ser Asp Tyr Phe Arg Gln Ser Glu		
		340	345
	Pro His Ser Pro Ile Ser Phe Leu Leu Glu Lys Ala Ile Arg Trp Gly		
		355	360
50	Tyr Leu Ser Leu Pro Glu Leu Leu Arg Glu Met Met Ser Glu Gln Asn		
		370	375
	Gly Asp Ala Leu Ser Thr Ile Phe Asn Ala Ala Gly Leu Asn His Leu		
		385	390
55	Asp Gln Val Leu Leu Pro Glu Val Ser Thr Pro Thr Val Gly Ile Glu		
		395	400

405 410 415  
 Ser Pro Gln Thr Pro Gln Ala Lys Pro Ser Val Ser Asp Pro Arg Ser  
 420 425 430  
 5 Val Glu Glu His Val Ser Gln Thr Ser Pro Val Asp Thr Gln Ser Lys  
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 10 Gln Asp Gln Lys Pro Gln Ser Ser Ala Thr Ser Ala Leu Ser Trp  
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 Ala Thr Ile Gly Gln Leu Glu Thr Ala Glu Gly Lys Asn Asp Gly Trp  
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 25 Phe Ala Ile Asn Ser Tyr Ser Trp Gly Gly Ala Arg Asn Val Ala Met  
 35 40 45  
 Asp Ile Gly Asn Gly Thr Asn Ala Asp Ser Gly Met Val Gly Val Ser  
 50 55 60  
 30 Glu Val Ser Val Thr Lys Glu Val Asp Gly Ala Ser Glu Asp Leu Leu  
 65 70 75 80  
 Ser Tyr Leu Phe Asn Pro Gly Lys Asp Gly Lys Thr Val Glu Val Ala  
 85 90 95  
 35 Phe Thr Lys Pro Ser Asn Asp Gly Gln Gly Ala Asp Val Tyr Phe Gln  
 100 105 110  
 40 Val Lys Leu Glu Lys Ala Arg Leu Val Ser Tyr Asn Val Ser Gly Thr  
 115 120 125  
 Asp Gly Ser Gln Pro Tyr Glu Ser Leu Ser Leu Ser Tyr Thr Ser Ile  
 130 135 140  
 45 Ser Gln Lys His His Tyr Glu Lys Glu Gly Gly Glu Leu Gln Ser Gly  
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 Gly Val Val Thr Tyr Asp Leu Pro Thr Gly Lys Met Thr Ser Gly Lys  
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<223> "Xaa" may be any, other or unknown amino acid

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Ile Thr Tyr Asp Val Glu Thr Asn Gly Ala Val Lys Thr Lys Glu Leu  
20 25 30  
10 Pro Phe Val Val Gly Val Ile Gly Asp Phe Ser Gly His Lys Pro Glu  
35 40 45  
Ser Glu Lys Val Asp Leu Glu Glu Arg Glu Phe Thr Gly Ile Asp Lys  
50 55 60  
15 Asp Asn Phe Asp Thr Val Met Gly Gln Ile His Pro Arg Leu Ser Tyr  
65 70 75 80  
Lys Val Asp Asn Lys Leu Ala Asn Asp Asp Ser Gln Phe Glu Val Asn  
20 85 90 95  
Leu Ser Leu Arg Ser Met Lys Asp Phe His Pro Glu Asn Leu Val Asp  
100 105 110  
25 Xaa Ile Glu Pro Leu  
115